

Application No. 10/697,725
Amendment and Response to Final Office Action mailed May 10, 2004

REMARKS

A. Introduction

The present Amendment is in response to Examiner's First Office Action mailed May 10, 2004. Claims 1-32 were pending. Claims 9-22 and 29-32 were withdrawn from consideration. Claim 1 is amended. Claim 8 is canceled. New claims 33-36 are added. Claims 1-7, 23-28, and 33-36 are now pending in view of the above amendments.

Applicants respectfully request the Examiner to reconsider the above-identified application in view of the following remarks. For the Examiner's convenience and reference Applicants' remarks are presented in the order in which corresponding issues were raised in the Office Action.

B. Restriction of Claims

Applicants acknowledge the provisional election of claims 1-8 and 23-28, and that claims 9-22 and 29-32 have been canceled without prejudice.

C. Rejections Under 35 U.S.C. § 103

The Examiner rejects claims 1-8 under 35 U.S.C. § 103(a) as being unpatentable over United States Patent No. 6,285,499 B1 to Xie, *et al.* ("*Xie*") in view of United States Patent No. 6,331,912 B1 to Au-Yeung, *et al.* ("*Au-Yeung*"). *Xie*, however, either alone or in combination with *Au-Yeung*, fails to teach or suggest each and every element of the pending claims, and thus does not make obvious the present invention.

With respect to the first cited reference, *Xie* teaches an optical circulator for use in telecommunication systems. In particular *Xie*, as seen in Figure 1, discloses an optical circulator 100 having various components, including a first optical port 102, a third optical port 104, a second optical port 106, a first beam displacer 122, and second beam displacer 150. Certain other optical

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components are interposed between the first beam displacer 122 and second beam displacer 150, such as first and second rotators 126A-B and 146A-B, and first and second beam angle turners 130A-B and 140A-B. The optical circulator 100 shown in Figure 1 of *Xie* is employed to enable unpolarized light entering at the first optical port 102 to arrive at second optical port 106, as well as allowing unpolarized light entering the second optical port 106 to arrive at the third optical port 104, in accordance with common optical circulation. See *Xie*, Fig. 1; col. 8, ll. 34-43; col. 10, l. 65-col. 11, l. 2; col. 11, ll. 36-38.

Similar to *Xie*, *Au-Yeung* also discloses an optical circulator for transferring light between optical ports. In detail, *Au-Yeung* teaches birefringent blocks 14A and 14B, between which are disposed a plurality of optical components. These optical components include a wave plate 16A, a rotator 20A, tapered birefringent plates 22 and 24, a birefringent block 26, half wave plates 16B and 18B, and rotator 20B. As shown in Figures 3 and 4, the optical circulator 100 of *Au-Yeung* transmits a light beam from an optical fiber 1 at one end of the circulator to an optical fiber 2 at an opposite end thereof. In like manner, the optical circulator 100 can be used to transmit a light beam from optical fiber 2 to an optical fiber 3 positioned adjacent the optical fiber 1. Note that this last operation channels the light beam from optical fiber 2 to optical fiber 3, and not to optical fiber 1, to enable common optical circulation. See *Au-Yeung* Fig. 3; col. 3, l. 13-col. 4, l. 56.

The claimed invention is substantially different from the devices taught by *Xie* or *Au-Yeung*. Specifically, amended independent claim 1, which discloses a *beam combiner* apparatus, requires the presence of "first and second *adjacent* optical fibers *that are configured to respectively transmit* first and second light beams *in a forward propagation direction*." Neither *Xie* nor *Au-Yeung* teach such a feature. Indeed, though *Xie* discloses adjacent optical ports 102 and 104 in its optical circulator (see Figure 1), only the first optical port is configured to transmit a light beam in a specified direction, while the adjacent third port 104 is actually configured to *receive* a light beam

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in a direction *opposite* that of the light beam transmitted by the first optical port. This configuration is necessary to enable optical circulation with respect to adjacent first and third ports, as described in lines 19-22 of column 1 of *Xie*, which state:

An optical circulator is a nonreciprocal, typically three-port or four-port, device. Light *entering the first port* passes out the second port, but light entering the second port can not pass back to first port. Instead, *it passes out of the third port*. (Emphasis added.)

Au-Yeung gives similar evidence of the patentable distinctions between the devices of *Au-Yeung* and *Xie* and the present claimed invention. In detail, lines 51-56 of column 4 of *Au-Yeung*, in referring to optical fiber 2 and adjacent optical fibers 1 and 3 of its optical circulator, state:

For circulator 100 to work properly, light entering the circulator from fiber 2 must be channeled into fiber 3. In other words, circulator 100 has the property of channeling light *from fiber 1* to fiber 2 and from fiber 2 *to fiber 3* without any light being channeled from fiber 2 back to fiber 1. (Emphasis added.)

Thus, not only do *Xie* and *Au-Yeung* fail to teach first and second adjacent optical fibers that are *each* configured to respectively *transmit* first and second light beams, as required in amended claim 1, but these references actually appear to teach away from the present claimed invention by teaching adjacent optical fibers, only *one* of which is used for transmitting light beams in a forward direction while the other only *receives* such light beams, which light beams travel in a backward direction. The failure of *Xie* and *Au-Yeung* to teach the required elements of the present claimed invention is not surprising given the fact that these references are directed to *optical circulators*, while the present claimed invention is directed to a *beam combiner apparatus* – a distinct device.

In light of the above, Applicants submit that *Xie* and *Au-Yeung* are inapposite to the present claimed invention. Applicants therefore submit further that a *prima facie* case of obviousness does not exist with respect to independent claim 1 in view of the cited references, and respectfully request that rejection of the claim under Section 103 be removed. Moreover, inasmuch as claims 2-

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7 are dependent upon independent claim 1, Applicants submit that these claims are also allowable for at least the reasons given above.

The Office Action also rejects claims 23-28 under 35 U.S.C. § 103(a) as being unpatentable over *Au-Yeung*. However, *Au-Yeung* fails to teach or suggest each and every element of the pending claims, and thus does not make obvious the present claimed invention.

The teachings of *Au-Yeung* are discussed above. With respect to independent claim 23, the claimed invention is substantially different from the device taught by *Au-Yeung*. Specifically, claim 23, which discloses a beam combiner apparatus, requires the presence of "a first optical fiber coupled to a first lens that transmits a first polarized light beam along a path in a forward propagation direction," and "a second optical fiber coupled to a second lens that transmits a second polarized light beam along a path in the forward propagation direction." As discussed above in connection with the rejection of claims 1-8, *Au-Yeung* fails to teach at least these limitations. *Au-Yeung* is therefore inapposite to the present claimed invention.

The present claimed invention differs from *Au-Yeung* in other respects as well. For instance, claim 23 further requires a third optical fiber, "wherein a third light beam transmitted through the third optical fiber along a path in a backward propagation direction is transmitted through the beam combiner apparatus such that the third light beam does not enter one of the first and second lenses." This limitation is neither taught nor suggested by *Au-Yeung*. In contrast, *Au-Yeung* directs light beams either from fiber 1 to fiber 2, or from fiber 2 to fiber 3, but in no case directs a light beam such that it fails to enter lenses associated with a first or second optical fiber, as in the present claimed invention. See *Au-Yeung*, col. 4, ll. 50-56; Figs. 3 and 4.

In light of this and the above remarks, then, Applicants therefore submit that a *prima facie* case of obviousness does not exist with respect to independent claim 23 in view of the cited reference, and respectfully request that rejection of the claim under Section 103 be removed.

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Moreover, inasmuch as claims 24-28 are dependent upon independent claim 23, Applicants submit that these claims are also allowable for at least the reasons given above.

D. New Claims

Applicants submit that new claims 33-36 are also allowable. In particular, independent claim 33, on which claims 34-36 depend, discloses a beam combiner apparatus requiring "a first optical fiber that transmits a first polarized light beam along a path in a forward propagation direction," and "a second optical fiber that transmits a second polarized light beam along a path in the forward propagation direction simultaneous to the transmission of the first light beam." As has been discussed above, neither *Xie* nor *Au-Yeung* disclose an optical fiber arrangement as set forth in claim 33. As such, Applicants respectfully submit that independent claim 33, together with dependent claims 34-36, is allowable in light of the cited art.

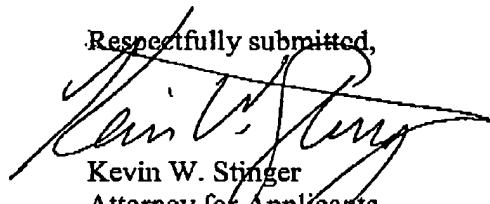
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CONCLUSION

In view of the discussion and amendments submitted herein, Applicant respectfully submits that each of the pending claims 1-7, 23-28, and 33-36 is now in condition for allowance and that any objections to the application have been resolved. Therefore, reconsideration of the rejections is requested and allowance of those claims is respectfully solicited. In the event that the Examiner finds any remaining impediment to a prompt allowance of this application that can be clarified in a telephonic interview, the Examiner is respectfully requested to initiate the same with the undersigned attorney.

Dated this 11th day of October, 2004.

Respectfully submitted,



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